NASA/Johns Hopkins Applied Physics Laboratory (JHU/APL)
Internship Program-2005

Position Title: Detector and electronics for space instrumentation

Keyword: DESI

Internship Topic: Research and development focusing on electronics design and testing of detector systems for space science instruments such as time, position and energy electronics for laser range finding and particle spectrometer-imagers. Includes software development and data analysis/visualization.

Number of Interns Needed: 2

PI Sponsor: Nick Paschalidis

Position Title: Solar magnetic field research

Keyword: SMFR

Internship Topic: Work with senior researchers to analyze data and compare results with theory. The goal is to understanding the mechanisms of solar mass ejections and other eruptive events on the Sun.

Number of Interns Needed: 2

PI Sponsor: David Rust

Position Title: Determination of solar radius variations from solar eclipse observations

Keyword: DSRV

Internship Topic: Analyze high-resolution videotapes of solar eclipses made from near the edges of the paths of total and annular eclipses during the past twenty years to determine small variations in the solar radius. Each video tape shows many "Baily's beads", small segments formed as the shrinking (before central eclipse) or expanding (after central eclipse) crescent of sunlit is broken at the ends by lunar mountains and valleys. The intern will determine the times of the formation and disappearance (or reappearance and merging after central eclipse) of the Baily's beads from a time-inserted copy of the tape. He/she will then use a PC windows software program that simulates and accurately portrays the beads to determine the angular locations of the lunar mountains and valleys that cause the bead events, and the predicted height of the solar limb above or below the lunar feature. The bead event angles and heights will then be used by another small computer program to use least-squares to solve for the correction to the average solar radius.

Number of Interns Needed: 1

PI Sponsor: David Dunham

Position Title: Europa Surface History

Keyword: EUSH

Internship Topic: Jupiter's moon Europa has an extremely young icy surface (in geological terms), and is thought to contain a global subsurface water ocean, perhaps favorable to the development of life. The surface is criss-crossed with a dense network of ice ridges and smooth bands, whose exact formation mechanism is still open to debate. They may have formed by tectonic activity resulting from tidal stresses, volcanic activity, or a combination of both. We are investigating how the topography of some of these surface features has changed over time, in order to better understand how they formed, and therefore gain insight into Europa's history and internal evolution. This project will involve mapping surface features using Galileo images, determining the sequence in which they formed, comparing their relative age with their relative topography, and using these results to test models of their formation.

Number of Interns Needed: 1

PI Sponsor: Louise Prockter

Position Title: Eros Crater interaction with Tectonic Features

Keyword: ECTF

Internship Topic: The NEAR Shoemaker spacecraft recently orbited the asteroid 433 Eros for a year, obtaining a variety of data, including many tens of thousands of images and laser ranging profiles. These show that the asteroid was pock-marked with impact craters, as well as numerous cracks and fractures at a variety of scales. We are investigating the interaction of impact craters with fractures, to see how the presence of a preexisting fracture affects the development of crater shape and depth, as well as to examine the effects of later fractures on crater morphology. Results from this study will help us to better understand the relationship between craters and tectonic structures on a variety of bodies, and will help to constrain the evolutional history of Eros. This project will involve categorizing and mapping surface features using NEAR Shoemaker images, and analyzing associated topographic data.

Number of Interns Needed: 1

PI Sponsor: Louise Prockter

Position Title: Spacecraft Ground Systems Software Development

Keyword: SGSD

Internship Topic: Development of web sites for presenting, receiving and distributing spacecraft operational and scientific data; tools for manipulating spacecraft data; graphical user interfaces for existing command line applications; documentation and testing of new and existing ground system applications. Candidates should have experience or college course work in C++; Java, Perl, and/or web site development and be familiar with the Unix operating system.

Number of Interns Needed: 2

PI Sponsor: Paul Lafferty

Position Title: Spacecraft Integration and Test

Keyword: SIAT

Internship Topic: Support testing of two NASA spacecraft, performing a variety of tasks as needed to support the test program. Tasks would include: development of data display pages, writing automated test scripts, processing spacecraft data, plotting spacecraft data, monitoring spacecraft test equipment during tests, and other associated spacecraft testing or operations tasks. The spacecraft testing is accomplished using an APL customized version of the EPOCH 2000 Spacecraft Control Software System. Some experience with simple software languages (BASIC, C) is desirable. Support of spacecraft testing both at APL and at Goddard Space Flight Center may be required.

Number of Interns Needed: 2

PI Sponsor: Elliot Rodberg

Position Title: Spacecraft Integration and Test

Keyword: SIAT

Internship Topic: During the intern period, the spacecraft will be undergoing environmental testing at NASA/Goddard Space Flight Center. Interns will assist the spacecraft test conductor in the APL Missions Operations Center to execute test scripts, monitor spacecraft telemetry, modify test procedures and maintain spacecraft logs. Additional responsibilities may include generating simple spacecraft test scripts (STOL), developing/modifying spacecraft page displays, and assisting in supporting the spacecraft ground support equipment activities. Assisting with test monitoring operations at NASA/Goddard Space Flight Center may also be required.

Number of Interns Needed: 2

PI Sponsor: Andrew Good

Position Title: Spacecraft Integration and Test

Keyword: SINT

Internship Topic: Assist in measuring spacecraft bonding and conducted and radiated emissions while the integration and acceptance testing is in progress. The Intern would be trained to make bonding measurements, install probes for conducted measurements and set up antennas for radiated measurements, run the spectrum analyzers, and analyze the data as well as the procedures to get the equipment into and out of the clean rooms. Full training to enter the clean rooms will be provided.

Number of Interns Needed: 1

PI Sponsor: Carl Herrmann

Position Title: Spacecraft Mission Operations Support

Keyword: SMOS

Internship Topic: Development of spacecraft telemetry display pages for both post-launch mission operations and pre-launch testing with the spacecraft and the hardware in the Loop Spacecraft Simulators. Development of these pages will involve obtaining some knowledge of the spacecraft subsystem telemetry and arranging telemetry points logically in the display.

In addition, Mission Operations will need help in developing scripts for testing and post-launch operations. Scripting will involve obtaining some knowledge of spacecraft subsystem and ground system commands, and some knowledge of the STOL language. Testing of the developed scripts on the hardware in the Loop Spacecraft Simulator will also be incorporated.

Number of Interns Needed: 2

PI Sponsor: John Eichstedt

Position Title: Spacecraft Thermal Support

Keyword: SPTS

Internship Topic: Thermal support for environmental testing of an actual NASA spacecraft, to include observatory-level thermal vacuum (TV) test plan final details, multi-layer thermal insulation blanket fabrication, and early TV test support. Mechanical skills (i.e., hands-on work with thermal hardware, blanket fabrication, etc.) and computer skills (Excel, Word) are desired.

Number of Interns Needed: 1

PI Sponsor: Jeff Maynard

Position Title: Spacecraft Thermal Support

Keyword: STHS

Internship Topic: Thermal support for actual NASA spacecraft, to include observatory-level thermal vacuum (TV) test preparation and testing, post test analysis. Mechanical skills (i.e., hands-on work with thermal hardware and blanket fabrication) and computer skills (Excel, Word) are desired.

Number of Interns Needed: 1

PI Sponsor: Doug Mehoke
